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190. Proposed by WILLIAM HOOVER, A. M., Ph. D., Professor of Mathematics and Astronomy, Ohio University, Athens, O.

Find the locus of the centers of sections of an ellipsoid by planes which are at a constant distance from the center.

CALCULUS.

154. Proposed by B. R. DOWNER, Hopkinsville, Ky.

At the equinox, when the sun is on the celestial equator, a man starts driving on a perfectly level plain.at six o'clock in the morning, and continues, going always from the sun, at the uniform rate of six miles per hour, until six o'clock in the evening. Required the path he will travel and the distance in a straight line from starting point to stopping point.

155. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

Solve the differential equations:

(*A*). $\frac{d^4y}{dx^4}+2\frac{d^2y}{dx^2}=\sin 2x+\sin x-x.$ (*B*). $\frac{d^2y}{dx^2}+2\frac{dy}{dx}=\sin 2x+\sin x-x.$

MECHANICS.

144. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics in The Temple College, Philadelphia, Pa.

Pressure is applied perpendicularly to the plane surface yz, bounding an otherwise infinite isotropic solid. Find the resultant displacements, if the pressure varies as $\sin\left(\frac{2\pi y}{a}\right)+\sinh\left(\frac{2\pi y}{a}\right)$.

145. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

ABCD, *GCEF* are equal parallelograms, *DCG* and *BCE* being straight lines. If the figure be considered as formed of smooth light jointed bars and if *BD* be a light rod, and the whole be suspended from *A*, find the stress in *BD* if a weight be hung from *F*. Also find the stress if a light rod *GE* replace *BD*.

DIOPHANTINE ANALYSIS.

104. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, O.

(1). The cube root of three cube numbers equals the square root of two square numbers. Determine the numbers.

(2). The sum of the square roots of three square numbers equals the sum of the cube roots of three cube numbers. Determine the numbers.

105. Proposed by H. S. VANDIVER, Bala, Pa.

Every odd factor of a^n+b^n is of the form $1(\mathrm{mod}\,2n)$.